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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,856	02/09/2004	Christopher F. Gallmeyer	99-647.1	9490

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CATERPILLAR INC.
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PATENT DEPT.
PEORIA, IL 616296490

EXAMINER

LEE, CLOUD K

ART UNIT	PAPER NUMBER
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3753

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/774,856

Applicant(s)

GALLMEYER ET AL.

Examiner

Cloud K. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-22 and 27-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-22 and 27-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 13-14, 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Sims et al (US Patent No. 5,354,032).

Sims et al. disclose a valve comprising an piezoelectric actuator (1A and 1B), an actuator control circuit (8 and 9) in electrical communication with the actuator, wherein the actuator control circuit applies a control signal (a voltage across the faces of the disc is read as a control signal, see Col 3 lines 67- Col 4 lines 5), the control signal controlling movement of the member relative to the contact surface and receives an output from the actuator (the control signal is controlling the movement of disc 1A and 1B, the sensor (SE) is indirectly electrical contact with the actuator (ME) when the disc 1A and 1B in a closed position, in other words, the sensor (SE) generate an output signal through the actuator (ME), which is proportional to the actual displacement of the device), a seat detection circuit (5A, also see figure 1) in electrical communication with the actuator control of the member with the contact surface from the output, wherein the seat detection circuit detects the impact of the member with the contact surface (5A) by detecting an abrupt change in the amplitude of the output voltage (see figure 4, since the displacement of the device is proportional to the voltage, figure 4 shows an abrupt change in the displacement and the amplitude of the output voltage, also see Col 4 lines 21-22).

3. Claims 13-22, 27-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Irokawa et al (US Patent No. 6,148,837).

Irokawa et al disclose a valve comprising an piezoelectric actuator (180), an actuator control circuit (from microcomputer 16 to piezoelectric element 180) in electrical communication with the actuator, wherein the actuator control circuit applies a control signal (a pulse is applied from microcomputer 16 to piezoelectric element 180, see Col 5 lines 28-32), the control signal controlling movement of the member relative to the contact surface and receives an output from the actuator, a seat detection circuit and a position control circuit (Sf, the feedback signal, the position indicator 20 is indirectly in electrical communication with the actuator control circuit and it determines contact of the member with the contact surface from the output) in electrical communication with the actuator control of the member with the contact surface from the output, wherein the seat detection circuit determines a rate of change of the output (the Sf feedback signal determines a rate of change), wherein the seat detection circuit determines contact of the member with the contact surface from a comparison of the rate of change of the output to a predetermines valve (see figure 4), a velocity control circuit (Sv), in electrical communication with the actuator control circuit and seat diction circuit (see figure 4), wherein the position control circuit determines a charge error as a function of the stored charge value and the current charge valve (Sf), wherein the velocity control circuit determines the input as a function of the charge error (Sv), wherein the position control circuit includes an integrator (when switch 208 is connected, the velocity control circuit is part of the position control circuit, therefore, the position control circuit includes an integrator 210), wherein the seat detection

circuit detects the impact of the member with the contact surface by detecting an abrupt change in the amplitude of the output voltage (see figure 5, line Sf), the output is used to adjust speed of the member (Sv), wherein the position control circuit includes a comparator that compares a desired charge (Sr and Sf).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 15-22 and 28-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sims et al. in view of Irokawa et al. (US Patent Number 6,148,837).

Sims et al. fail to disclose the control system controlling velocity and position with the control loop. Irokawa et al. disclose a control system used in a similar valve that determines

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both speed and position with the control loop comparing the actual and the desired parameters.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the control system of Irokawa et al. with the valve of Sims et al. in order to provide a control system that can change between a PD (position) control mode and a PID (position and velocity) control mode to eliminate overshoot or an oscillation as taught by Irokawa et al.

6. Claims 13-22 and 27-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irokawa et al. (US Patent Number 6,148,837) in view of Sims et al (US Patent No. 5,354,032).

Under a more limiting interpretation, Irokawa et al fails to disclose a seat detection circuit wherein the seat detection circuit determines contact of the member with the contact surface.

Sims et al disclose a seat detection circuit (5A, also see figure 1) in electrical communication with the actuator control of the member with the contact surface from the output. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided a seat detection circuit in order to provide a close loop control of the piezoelectric member and monitor the voltage by the sense electrode (SE) as taught by Sims (see Col 4 lines 22-26).

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined

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application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 13, 14, and 17 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 2 of U.S. Patent No. 6,285,115 in view of Sims et al.

Claim 2 of '115 fails to disclose an explicit recitation to a seat detection circuit (however, a position control circuit could be considered to encompass a seat detection circuit because the seated position is a position detected by the seat detection circuit). Sims et al. disclose a seat detection circuit used in a similar apparatus. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the seat detection circuit of Sims et al. with the device of claim 2 of '115 in order to detect the seated position of the valve and provide a closed loop control of the PE actuator as taught by Sims et al.

9. Claims 13-22 and 27-35 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 2 of U.S. Patent No. 6,285,115 in view of Sims et al. and Irokawa et al.

Claim 2 of '115 fails to disclose an explicit recitation to a seat detection circuit (however, a position control circuit could be considered to encompass a seat detection circuit because the

seated position is a position detected by the seat detection circuit). Sims et al. disclose a seat detection circuit used in a similar apparatus. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the seat detection circuit of Sims et al. with the device of claim 2 of '115 in order to detect the seated position of the valve and provide a closed loop control of the PE actuator as taught by Sims et al.

The modified claim 2 of '115 fails to disclose all the details to the control system controlling velocity and position with the control loop. Irokawa et al. disclose a control system used in a similar valve that determines both speed and position with the control loop comparing the actual and the desired parameters. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the control system of Irokawa et al. with the system of the modified claim 2 of '115 in order to provide a control system that can change between a PD (position) control mode and a PID (position and velocity) control mode to eliminate overshoot or an oscillation as taught by Irokawa et al.

Response to Arguments

10. Applicant's arguments filed 10/27/06 have been fully considered but they are not persuasive.

The examiner disagrees with applicant's argument that Sims et al does not disclose the actuator (ME) that generates an output, Sims et al discloses the control signal is controlling the movement of disc 1A and 1B, the sensor (SE) is indirectly electrical contact with the actuator (ME) when the disc 1A and 1B in a closed position, in other words, the sensor (SE) generate an output signal through the actuator (ME), therefore, Sims et al anticipate claims 13 and 14.

Regarding rejection of claims 15-22 under 35 U.S.C. 103(a), Sims et al disclose the actuator that generates an output, as discussed in detail above.

Regarding rejection of claims 13-22 under nonstatutory obviousness-type double patenting, Sims et al disclose the actuator that generates an output, as discussed in detail above. Furthermore, the positive recitations, such as "...in electrical communication with..." and "...wherein the actuator control circuit applies..." in claims 13 and 17 are variation of the functional limitations, therefore, claims 13-22 and 27-35 are rejected under nonstatutory obviousness-type double patenting.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

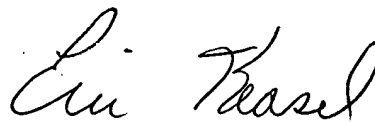
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cloud K. Lee whose telephone number is (571)272-7206. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eric Keasel can be reached on (571)272-4929. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CL



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